National Institute of Environmental Health Sciences

North-South divide: Contrasting impacts of climate change on crop yields in Scotland and England

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Abstract:

Effects of climate change on productivity of agricultural crops in relation to diseases that attack them are difficult to predict because they are complex and nonlinear. To investigate these crop-disease-climate interactions, UKCIP02 scenarios predicting UK temperature and rainfall under high- and low-CO(2) emission scenarios for the 2020s and 2050s were combined with a crop-simulation model predicting yield of fungicide-treated winter oilseed rape and with a weather-based regression model predicting severity of phoma stem canker epidemics. The combination of climate scenarios and crop model predicted that climate change will increase yield of fungicide-treated oilseed rape crops in Scotland by up to 0.5 t ha(-1) (15%). In contrast, in southern England the combination of climate scenarios, crop, disease and yield loss models predicted that climate change will increase yield losses from phoma stem canker epidemics to up to 50 per cent (1.5 t ha(-1)) and greatly decrease yield of untreated winter oilseed rape. The size of losses is predicted to be greater for winter oilseed rape cultivars that are susceptible than for those that are resistant to the phoma stem canker pathogen Leptosphaeria maculans. Such predictions illustrate the unexpected, contrasting impacts of aspects of climate change on crop-disease interactions in agricultural systems in different regions.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2839380

Resource Description

Communication: ☑

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience: ☑

audience to whom the resource is directed

Policymaker

Exposure : ☑

weather or climate related pathway by which climate change affects health

Food/Water Security

Food/Water Security: Agricultural Productivity

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Scotland;England

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Medium-Term (10-50 years)

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content